

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

- 1 1. (original) A method comprising:
2 copying a unit of data in a copy data write operation from a source volume of a
3 first organization type to a destination volume of a second organization type;
4 writing a progress indicator in a progress indicator data write operation to an area
5 of said destination volume indicating the successful copying of at least said unit of data;
6 copying a plurality of additional units of data in a plurality of additional copy data
7 write operations from said source volume to said destination volume; and
8 writing an additional progress indicator in an additional progress indicator data
9 write operation to said area of said destination volume indicating the successful copying
10 of at least said plurality of units of data wherein the number of progress indicator data
11 write operations is less than the number of copy data write operations.
- 1 2. (original) The method of claim 1 wherein said second organization type is a
2 Redundant Array of Independent Disks organization.
- 1 3. (original) The method of claim 2 wherein said unit of data is a stripe of data
2 written across an array of disks of said Redundant Array of Independent Disks
3 organization.
- 1 4. (original) The method of claim 3 further comprising:
2 copying an additional unit of data in an additional copy data write operation from
3 said source volume to said destination volume;
4 testing for the presence of at least one condition of a defined set of conditions;
5 and
6 writing an additional progress indicator in connection with said copying an
7 addition unit of data when any one condition of said defined set of conditions is present.

1 5. (original) The method of claim 4 wherein said testing tests for the presence of
2 each condition of said defined set of conditions, the method further comprising:
3 bypassing the writing of an additional progress indicator in connection with said
4 copying an addition unit of data when each condition of said defined set of conditions is
5 absent.

1 6. (original) The method of claim 4 wherein source volume and said destination
2 volume include a common disk drive.

1 7. (original) The method of claim 6 wherein said defined set of conditions
2 includes the condition of the destination location within the destination volume for a
3 particular unit of data overlaps with the source location within the source volume for the
4 particular unit of data.

1 8. (original) The method of claim 6 wherein said defined set of conditions
2 includes the condition of the expiration of a predetermined time period since the last
3 progress indicator data write operation.

1 9. (original) The method of claim 6 wherein said defined set of conditions
2 includes the condition of the count of copy data write operations since the last progress
3 indicator data write operation exceeding a predetermined count.

1 10. (original) The method of claim 6 wherein said defined set of conditions
2 includes the condition of a host issuing a write request to a location containing a
3 particular unit of data copied to the destination volume and the last progress indicator
4 written to the area of the destination volume lacks an indication that the particular unit of
5 data has been successfully copied to the destination volume.

1 11. (currently amended) The method of claim 6 wherein said units of data are
2 copied to the destination volume in address sequential order and the defined set of
3 conditions includes the condition of a unit of data in the sequence to be copied having a
4 destination location within the destination volume, which overlaps with a portion of the

5 ~~source location within the source~~ destination volume containing units of data copied and
6 the last progress indicator lacks an indication that the units of data of the ~~source~~
7 destination volume portion have been successfully copied to the destination volume.

1 12. (original) The method of claim 2 wherein said area of said destination
2 volume is a Redundant Array of Independent Disks organization configuration area.

1 13. (original) An article comprising a storage medium, the storage medium
2 comprising machine readable instructions stored thereon to:

3 copy a unit of data in a copy data write operation from a source volume of a first
4 organization type to a destination volume of a second organization type;

5 write a progress indicator in a progress indicator data write operation to an area
6 of said destination volume indicating the successful copying of at least said unit of data;

7 copy a plurality of additional units of data in a plurality of additional copy data
8 write operations from said source volume to said destination volume; and

9 write an additional progress indicator in an additional progress indicator data
10 write operation to said area of said destination volume indicating the successful copying
11 of at least said plurality of units of data wherein the number of progress indicator data
12 write operations is less than the number of copy data write operations.

1 14. (original) The article of claim 13 wherein said second organization type is a
2 Redundant Array of Independent Disks organization.

1 15. (original) The article of claim 14 wherein said unit of data is a stripe of data
2 written across an array of disks of said Redundant Array of Independent Disks
3 organization.

1 16. (original) The article of claim 15 wherein the storage medium further
2 comprises machine readable instructions stored thereon to:

3 copy an additional unit of data in an additional copy data write operation from
4 said source volume to said destination volume;

5 test for the presence of at least one condition of a defined set of conditions; and

6 write an additional progress indicator in connection with said copying an addition
7 unit of data when any one condition of said defined set of conditions is present.

1 17. (original) The article of claim 16 wherein the machine readable instructions
2 to test include machine readable instructions stored on the storage medium to test for the
3 presence of each condition of said defined set of conditions, and wherein the storage
4 medium further comprises machine readable instructions stored thereon to:

5 bypass the writing of an additional progress indicator in connection with said
6 copying an addition unit of data when each condition of said defined set of conditions is
7 absent.

1 18. (original) The article of claim 16 wherein source volume and said destination
2 volume include a common disk drive.

1 19. (original) The article of claim 18 wherein said defined set of conditions
2 includes the condition of the destination location within the destination volume for a
3 particular unit of data overlaps with the source location within the source volume for the
4 particular unit of data.

1 20. (original) The article of claim 18 wherein said defined set of conditions
2 includes the condition of the expiration of a predetermined time period since the last
3 progress indicator data write operation.

1 21. (original) The article of claim 18 wherein said defined set of conditions
2 includes the condition of the count of copy data write operations since the last progress
3 indicator data write operation exceeding a predetermined count.

1 22. (original) The article of claim 18 wherein said defined set of conditions
2 includes the condition of a host issuing a write request to a location containing a
3 particular unit of data copied to the destination volume and the last progress indicator
4 written to the area of the destination volume lacks an indication that the particular unit of
5 data has been successfully copied to the destination volume.

1 23. (currently amended) The article of claim 18 wherein said units of data are
2 copied to the destination volume in address sequential order and the defined set of
3 conditions includes the condition of a unit of data in the sequence to be copied having a
4 destination location within the destination volume, which overlaps with a portion of the
5 ~~source location within the source~~ destination volume containing units of data copied and
6 the last progress indicator lacks an indication that the units of data of the ~~source~~
7 destination volume portion have been successfully copied to the destination volume.

1 24. (original) The article of claim 14 wherein said area of said destination
2 volume is a Redundant Array of Independent Disks organization configuration area.

1 25. (original) A system, comprising:
2 at least one memory which includes an operating system and an
3 application;
4 a processor coupled to the memory;
5 data storage which includes a destination volume and a source volume
6 containing units of data;
7 a data storage controller for managing Input/Output (I/O) access to the
8 data storage; and
9 a device driver executable by the processor in the memory, wherein at
10 least one of the application, operating system, and device driver is adapted to:
11 copy a unit of data in a copy data write operation from a source volume of
12 a first organization type to a destination volume of a second organization type;

13 write a progress indicator in a progress indicator data write operation to
14 an area of said destination volume indicating the successful copying of at least
15 said unit of data;
16 copy a plurality of additional units of data in a plurality of additional copy
17 data write operations from said source volume to said destination volume; and
18 write an additional progress indicator in an additional progress indicator
19 data write operation to said area of said destination volume indicating the
20 successful copying of at least said plurality of units of data wherein the number of
21 progress indicator data write operations is less than the number of copy data write
22 operations.

1 26. (original) The system of claim 25 wherein said second organization type is a
2 Redundant Array of Independent Disks organization.

1 27. (original) The system of claim 26 wherein said storage includes an array of
2 storage disks organized in said Redundant Array of Independent Disks organization and a
3 unit of data is a stripe of data written across said array of disks of said Redundant Array
4 of Independent Disks organization.

1 28. (original) The system of claim 27 at least one of the application, operating
2 system, and device driver is further adapted to:
3 copy an additional unit of data in an additional copy data write operation from
4 said source volume to said destination volume;
5 test for the presence of at least one condition of a defined set of conditions; and
6 write an additional progress indicator in connection with said copying an addition
7 unit of data when any one condition of said defined set of conditions is present.

1 29. (original) The system of claim 28 wherein said testing tests for the presence
2 of each condition of said defined set of conditions, and at least one of the application,
3 operating system, and device driver is further adapted to:
4 bypass the writing of an additional progress indicator in connection with said

5 copying an addition unit of data when each condition of said defined set of conditions is
6 absent.

1 30. (original) The system of claim 28 wherein source volume and said
2 destination volume include a common disk drive.

1 31. (original) The system of claim 30 wherein said defined set of conditions
2 includes the condition of the destination location within the destination volume for a
3 particular unit of data overlaps with the source location within the source volume for the
4 particular unit of data.

1 32. (original) The system of claim 30 wherein said defined set of conditions
2 includes the condition of the expiration of a predetermined time period since the last
3 progress indicator data write operation.

1 33. (original) The system of claim 30 wherein said defined set of conditions
2 includes the condition of the count of copy data write operations since the last progress
3 indicator data write operation exceeding a predetermined count.

1 34. (original) The system of claim 30 wherein said defined set of conditions
2 includes the condition of a host issuing a write request to a location containing a
3 particular unit of data copied to the destination volume and the last progress indicator
4 written to the area of the destination volume lacks an indication that the particular unit of
5 data has been successfully copied to the destination volume.

1 35. (original) The system of claim 30 wherein said units of data are copied to the
2 destination volume in address sequential order and the defined set of conditions includes
3 the condition of a unit of data in the sequence to be copied having a destination location
4 within the destination volume, which overlaps with a portion of the source location
5 within the source volume containing units of data copied and the last progress indicator
6 lacks an indication that the units of data of the source volume portion have been
7 successfully copied to the destination volume.

1 36. (original) The system of claim 26 wherein said area of said destination
2 volume is a Redundant Array of Independent Disks organization configuration area.

1 37. (original) The system of claim 25 further comprising a video controller
2 coupled to said processor.

1 38. (original) A device for use with a data storage which includes a destination
2 volume and a source volume containing units of data, comprising:

3 means for copying a unit of data in a copy data write operation from a source
4 volume of a first organization type to a destination volume of a second organization type;
5 and

6 means for writing a progress indicator in a progress indicator data write operation
7 to an area of said destination volume indicating the successful copying of at least said
8 unit of data;

9 wherein the copying means includes means for copying a plurality of additional
10 units of data in a plurality of additional copy data write operations from said source
11 volume to said destination volume; and

12 wherein the writing means includes means for writing an additional progress
13 indicator in an additional progress indicator data write operation to said area of said
14 destination volume indicating the successful copying of at least said plurality of units of
15 data wherein the number of progress indicator data write operations is less than the
16 number of copy data write operations.

1 39. (original) The device of claim 38 wherein said storage includes an array of
2 storage disks organized in a Redundant Array of Independent Disks organization and a
3 unit of data is a stripe of data written across said array of disks of said Redundant Array
4 of Independent Disks organization.

1 40. (original) The device of claim 38 wherein:
2 the copying means includes means for copying an additional unit of data in an
3 additional copy data write operation from said source volume to said destination volume;

4 the device further includes testing means for testing for the presence of at least
5 one condition of a defined set of conditions; and
6 the writing means includes means for writing an additional progress indicator in
7 connection with said copying an addition unit of data when any one condition of said
8 defined set of conditions is present.